

Propagation Scheme - Physical Models

- phase function model from Rayleigh scattering:

Phase Functions¹

$$P(\omega) = \frac{T(\omega)}{\int_{k\pi}^{(k+1)\pi} T(\omega) d\omega}$$

with $\int_0^\pi P(\omega) = 1.$

- each tensor is then a unique footprint: $t_{i,j} \mapsto T(\omega)$

¹http://www.met.reading.ac.uk/~jp902366/rad/phase_function_report.pdf

Propagation Scheme - Physical Models

- crystal lattices reveal refractive indices dependent on direction, which lead to anisotropic light transport inside the medium (birefringence: e.g. quartz, ruby):

Indicatrix² - Refractive Ellipsoid

$$T(\omega) = \frac{ab}{\sqrt{a^2 \sin^2(\omega) + b^2 \cos^2(\omega)}} = \frac{n_1 n_2}{\sqrt{n_1^2 \sin^2(\omega) + n_2^2 \cos^2(\omega)}}$$

- each tensor is then a unique footprint: $t_{i,j} \mapsto T(\omega)$

²<http://edafologia.ugr.es/optmine/intro/indicatw.htm>